Technologies before Science

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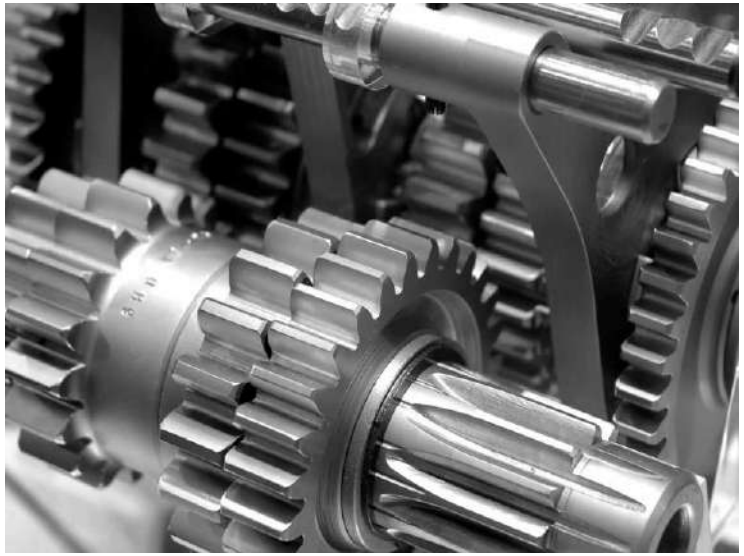
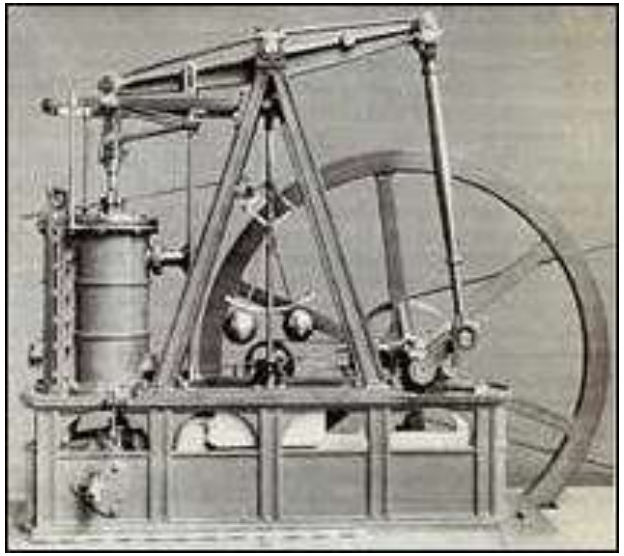
NQSTI National Quantum Science and Technology Institute

Technologies based on the Physics we teach engineers

Mechanics



Thermodynamics



Electrodynamics

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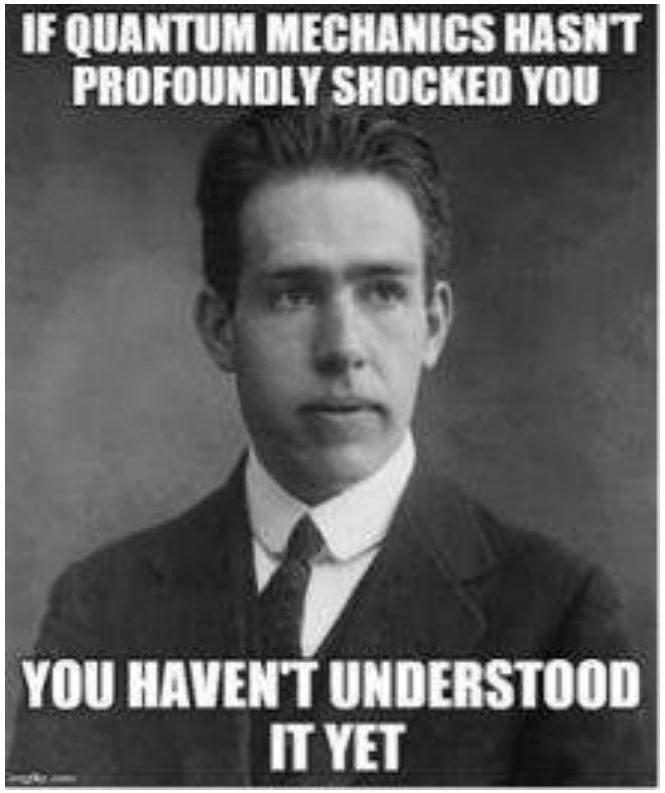
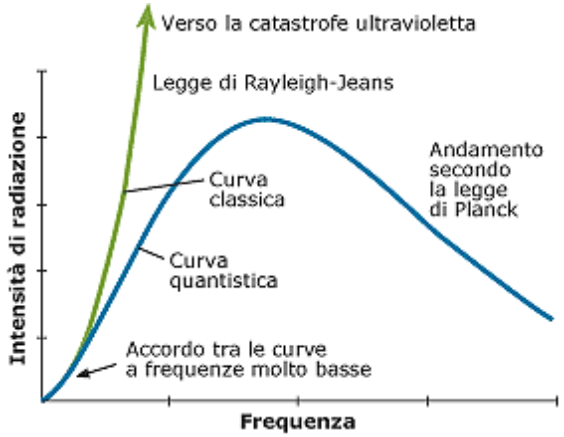
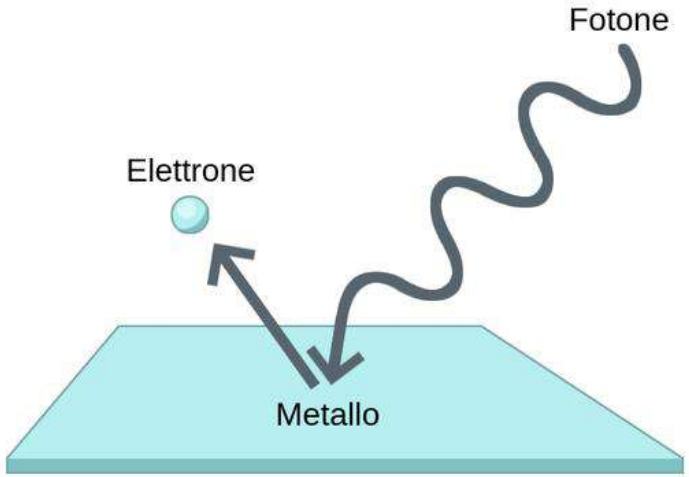
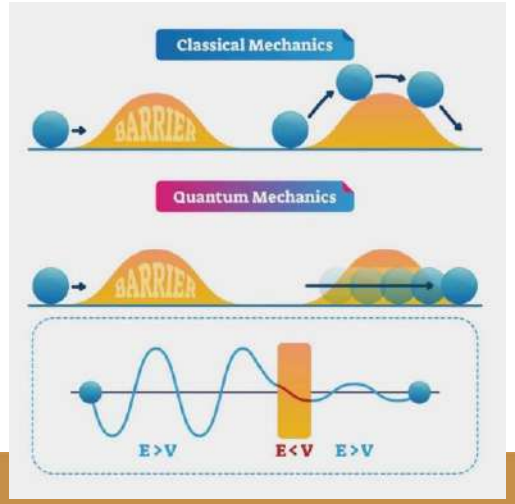
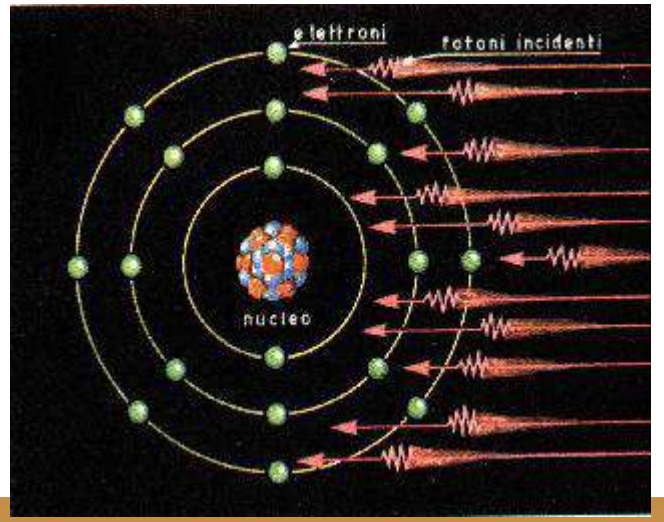
Beginning of XX century: Quantum Mechani



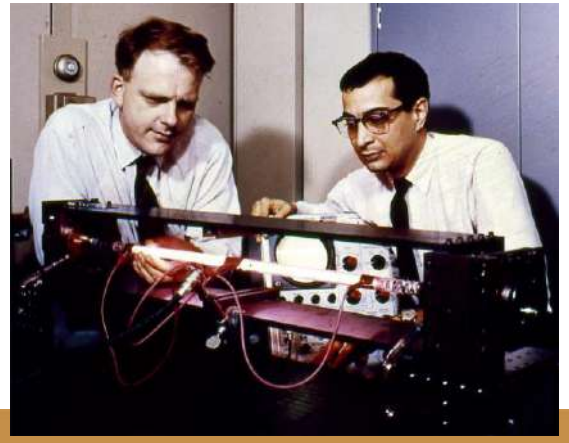


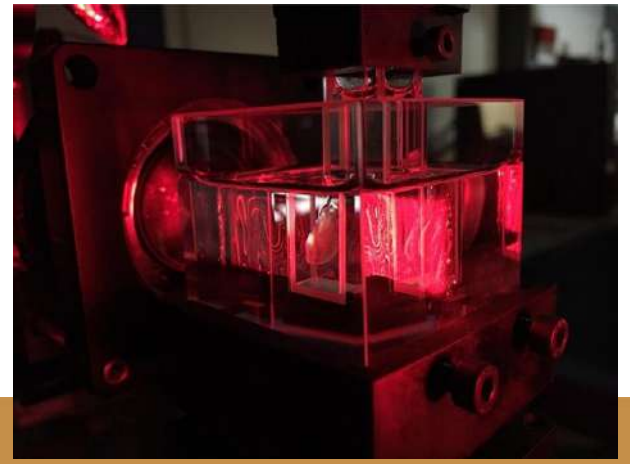






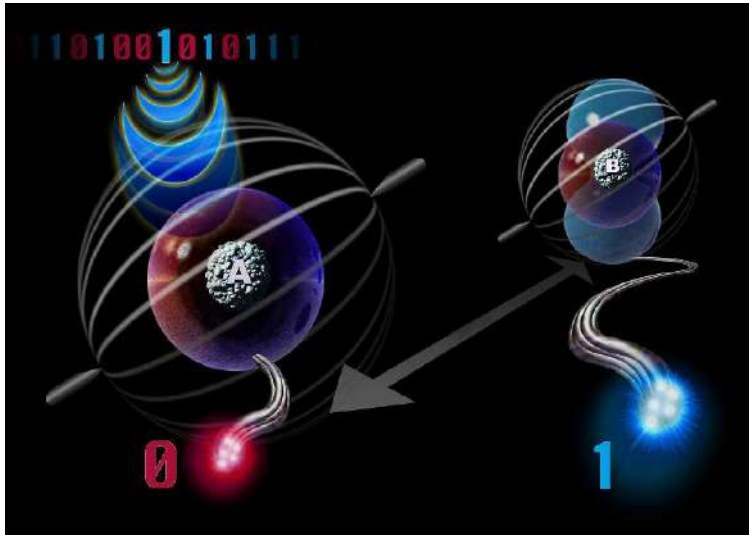
I Quantum Revolution: based on physics engineers learn on their own





II Quantum Revolution: based on the physics engineer do not know yet

- Information, its acquisition, storage, transmission and processing is **fundamentally physics**
- Ultimate elements of processors will be of **quantal size**
- **Tremendous "speed-up"** may be possible using quantum mechanical systems
- Quantum techniques will have **wide applications in science and technology**



"But it could be that the most and mysterious feature of quantum mechanics, known as 'quantum entanglement' has not been exploited yet. Quantum entanglement opens the way to radically new ways of transmitting and processing information…"

T. W. Hänsch, 2005 Nobel Laureate

II Quantum Revolution

Quantum Computers
will help solving
complex problems

Quantum Sensors
will measure brain activity

Quantum Simulators
will advance medicine

Quantum Communication
helps protecting your data

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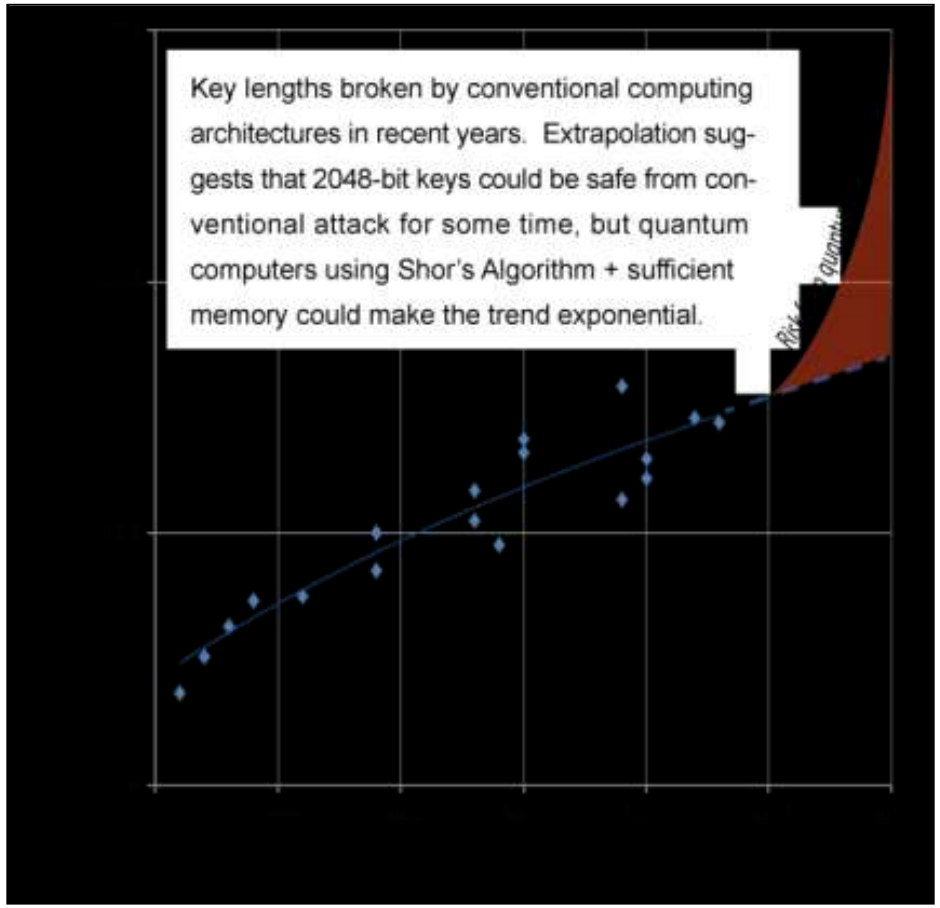
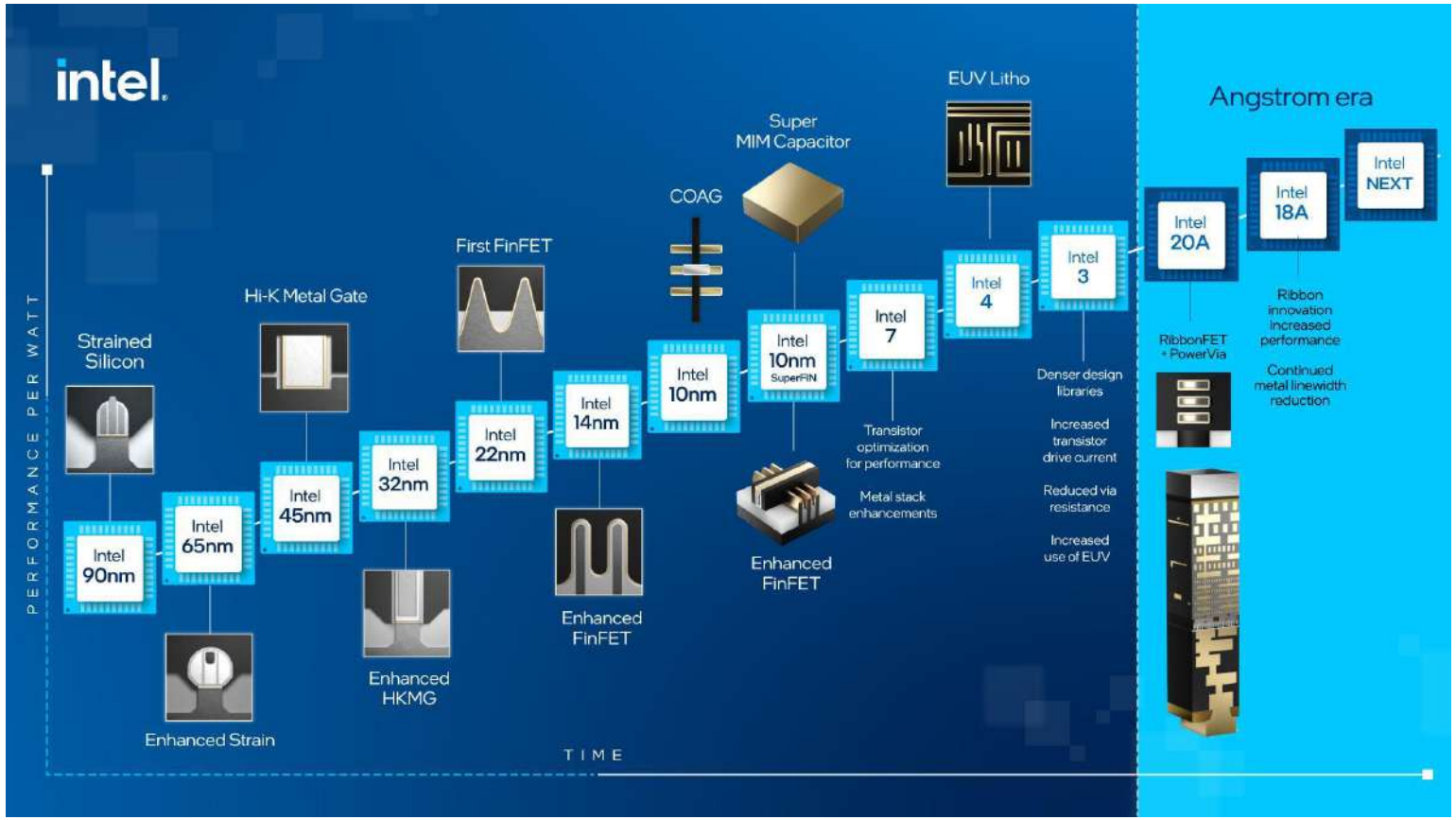
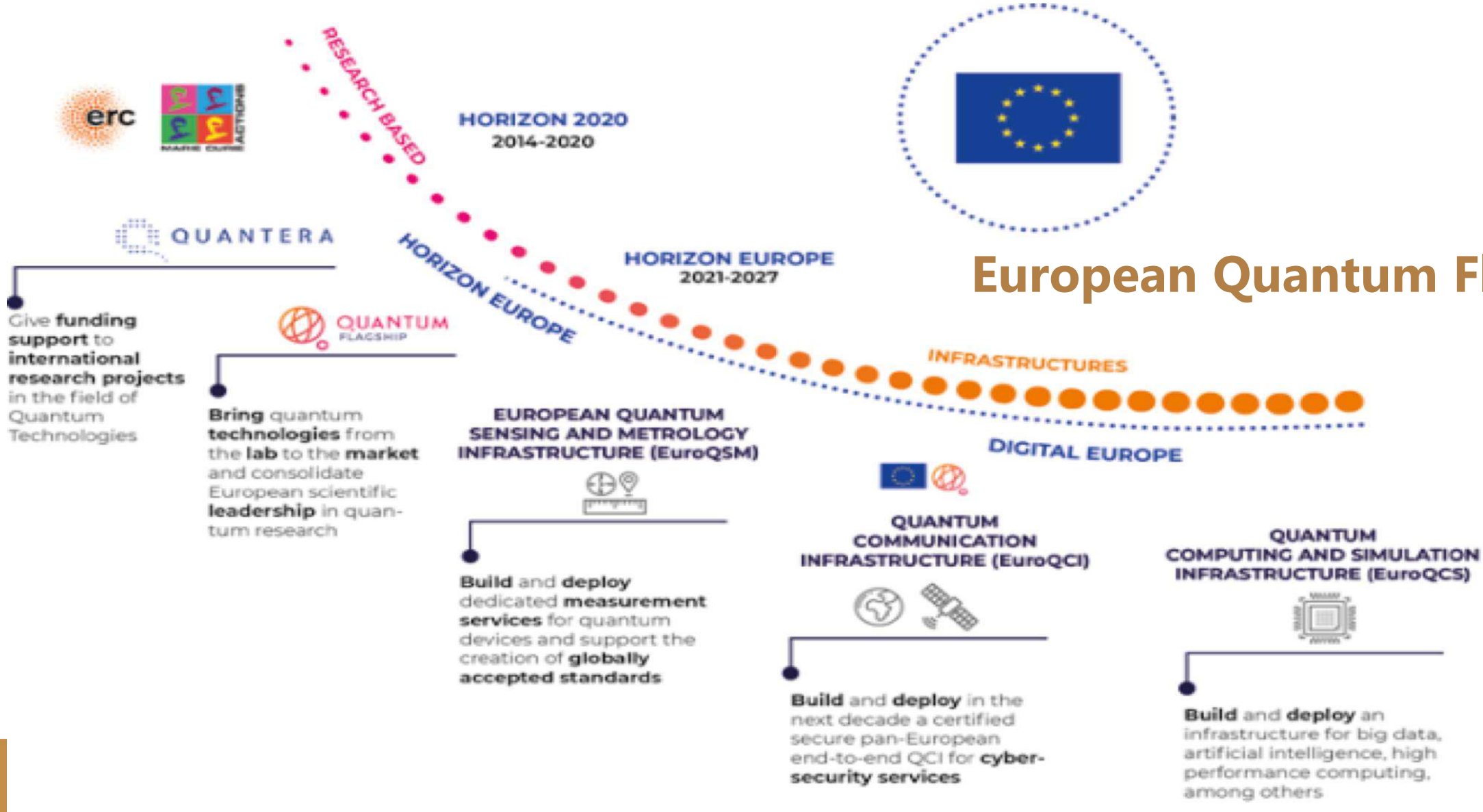
Quantum is here to stay!





European Quantum Fleet



The Italy National Recovery and Resilience Plan allocates 215 M€ to Quantum Technologies in the next 3 years.